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Appl. No. 10/530,266
Amdt. Dated September 29, 2006
Reply to Office Action of June 29, 2006

SEP 29 2006

REMARKS

The specification has been objected to as not being descriptive. The title has been amended to read: Integrated Circuit Comprising a Plurality of Processing Modules and a Network and Method for Exchanging Data Using Same. Applicants assert that the new title is clearly indicative of the claimed invention.

Claims 1 to 9 are currently pending in the present application. Claims 1 to 9 stand rejected. Claims 1 and 9 are amended. The amendments are supported by the application as originally filed. Therefore no new matter has been added by the amendments. Reconsideration of the present application, as amended, is respectfully requested.

Claims 1 to 9 stand rejected by the Action under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,807,118 to Lin et al. (hereinafter "Lin") in view of U.S. Patent No. 6,885,638 to Xu et al. (hereinafter "Xu").

Independent claim 1 is amended in order to more clearly define the present claimed invention over the cited references. Amended claim 1 now claims an integrated circuit comprising a plurality of processing modules (M, S) said modules being disposed on the same chip, and a network (N; RN) arranged for providing at least one connection between a first and at least one second module (M, S), wherein said modules communicate via a network on chip, and wherein said connection supports transactions comprising outgoing messages from the first module to the second modules and return messages from the second modules to the first module, the integrated circuit comprising at least one dropping means (DM) for dropping data exchanged by said first and second module (M, S). Neither Lin nor Xu, taken either alone or in combination, teaches the invention as set forth in claim 1. Specifically, neither Lin nor Xu disclose communication via a network on chip (NoC).

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As disclosed by the subject application, networks on chip (NoC) provide a solution to the interconnect problems in highly-complex chips by resolving the electrical problems in deep-submicron technologies through wire sharing, structure and management. Moreover, NoCs decouple computation from communication, which is essential in managing the design of billion-transistor chips. However, NoC's premises are different from off-chip networks, and, therefore, most of the network design choices must be reevaluated. For example, on-chip networks have different properties (e.g., tighter link synchronization) and constraints (e.g., higher memory costs) leading to different design choices, which ultimately affect the network services.

In a NoC, the destination of a transaction cannot signal directly to a source that its input buffer is full. Consequently, transactions to a destination can be started, possibly from multiple sources, after the destination's input buffer has filled up. If an input buffer is full, additional incoming transitions are not accepted and are stored in the network. The invention of claim 1 teaches that end-to-end control is implemented between a master and a slave to insure that no data is dropped in the connection between the modules. The data therefore arrive in the requested order and in time, therefore no contention or "traffic jam" will occur in the network.

Lin is directed to a method for handling requests for information over a very high speed network where, due to the nature of the request, the time required to handle the request is longer than the timeout set up to handle lost messages on the network. Thus, a method is described for transferring idempotent and non-idempotent requests over a network between two or more computer systems. The invention disclosed by Lin is especially adapted for a network of the collision detection variety, for example, ETHERNET. However, Lin fails to disclose an integrated circuit which incorporates communication via a network on chip (NoC), as clearly claimed in claim 1. Moreover, as conceded by the Action, Lin fails to disclose a system comprising at least one dropping means for dropping data exchanged by a first and a second module, as is clearly claimed in claim 1.

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The Action suggests that Xu discloses a system comprising at least one dropping means as claimed in claim 1. The Action further asserts that it would have been obvious to combine the teachings of Xu with the teachings of Lin because it would reduce congestion in the backhaul links. Applicants respectfully traverse this suggestion as evidenced by the fact that Xu, similar to Lin, fails to disclose an integrated circuit which incorporates a network on chip (NoC), as clearly claimed in claim 1. Rather, Xu is directed to communication systems and methods that employ communication packet dropping to reduce communication link congestion. To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). The cited combination fails to suggest all elements of claim 1 because neither Lin nor Xu disclose an operable circuit comprising communication via a network on chip (NoC).

In view of the foregoing, independent claim 1 is patentable over Lin and Xu when taken either singly under 35 U.S.C. § 102 or in combination under 35 U.S.C. § 103(a). Therefore, claim 1 is patentable over all of the references of record under 35 U.S.C. § 102 as well as 35 U.S.C. § 103(a). Accordingly, the rejections under 35 U.S.C. § 103(a) of claim 1 should be withdrawn and claim 1 should be allowed.

Claims 2 to 8 are either directly or indirectly dependent on claim 1 and are patentable over the references of record in view of their dependence on claim 1 and because the references of record do not disclose, teach or suggest each of the limitations set forth in claims 2 to 8.

Claim 9 has been amended to claim a method for exchanging messages in an integrated circuit comprising a plurality of modules, wherein said modules communicate via a network on chip, the messages between the modules being exchanged over connections via a network, wherein said connection supports transactions comprising outgoing messages from the first module to the second module and return messages from

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the second module to the first module, wherein data exchanged by said first and second module (M,S) can be dropped.

Neither Lin nor Xu taken either alone or in combination, teaches the invention as set forth in claim 9, as amended, for the reasons discussed with respect to claim 1. Thus, independent claim 9 is patentable over Lin and Xu when taken either singly under 35 U.S.C. § 102 or in combination under 35 U.S.C. § 103(a). Therefore, claim 9 is patentable over all of the references of record under 35 U.S.C. § 102 as well as 35 U.S.C. § 103(a). Accordingly, the rejections under 35 U.S.C. § 103(a) of claim 9 should be withdrawn and claim 9 should be allowed.

Conclusion

In view of the foregoing, Applicants respectfully submit that the specification, the drawings and all claims presented in this application are currently in condition for allowance. Accordingly, Applicants respectfully request favorable consideration and that this application be passed to allowance.

Should any changes to the claims and/or specification be deemed necessary to place the application in condition for allowance, the Examiner is respectfully requested to contact the undersigned to discuss the same.

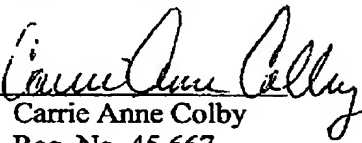
Applicants' representative believes that this response is being filed in a timely manner. In the event that any extension and/or fee is required for the entry of this amendment the Commissioner is hereby authorized to charge said fee to Deposit Account No. 14-1270. An early and favorable action on the merits is earnestly solicited.

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If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call David Barnes, Esq., Intellectual Property Counsel, Philips North America Corporation at the number below.

Respectfully submitted,

By:



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